

ABSTRACT OF THE DISCLOSURE

The present invention facilitates semiconductor device operation and fabrication by providing a cap-annealing process that improves channel electron mobility without substantially degrading PMOS transistor devices. The process uses an oxide/nitride composite cap to alter the active dopant profile across the channel regions. During an annealing process, dopants migrate out of the Si/SiO₂ in a channel region thereby altering the dopant profile of the channel region. This altered profile generally improves channel mobility thereby improving transistor performance and permitting smaller density designs.